| **Title** | ***RF PLC Interlock Upgrade*** | | | |
|---|---|---|---|---|
| Project Requestor | Dave Bromberek | | | |
| Date | 4/17/08 | | | |
| Group Leader(s) | Ali Nassiri | | | |
| Machine or Sector Manager | Nick Sereno/Louis Emery | | | |
| Category | Obsolescence/Spares | | | |
| Content ID* | APS_1271281 | Rev. | 2 | 4/17/08 3:50 PM |

*This row is filled in automatically on check in to ICMS. See Note [1]

## Description:

| **Start Year (FY)** | **2009** | **Duration (Yr)** | **3** |
|---|---|---|---|

**Objectives:**

To improve rf system reliability and serviceability.

**Benefit:**

Improved rf system reliability and serviceability, better accuracy on klystron water temperature and flow metering, simplification of interlock system topology and hardware, including EPICS interface hardware.

**Risks of Project:** See Note [2]

N/A

**Consequences of Not Doing Project:** See Note [3]

Lower system reliability resulting in increased downtime, increased maintenance requirements, lower accuracy on klystron water calorimetric calculations, obsolescence of existing process meters.

**Cost/Benefit Analysis:** See Note [4]

267 process meters (~$700ea.) will be replaced by the PLC systems. Due to age, the failure rate is increasing yearly resulting in increased downtime. Replacement of all process meters + spares would cost ~$200k. A PLC based system provides more versatility, reliability and serviceability.

**Description:**

This project involves replacement of the existing process meter and relay-based interlock systems at the RF5 klystron racks and also the Booster Injection/Extraction cavity and Storage Ring sectors 36-40 cavity racks, with PLC-based interlock systems that will include a local touch-screen operator interface and a direct network interface to EPICS. Included in this upgrade will be replacement of all thermocouples in the klystron water circuits with RTD devices for better long-term stability and accuracy of temperature measurements.

## Funding Details

**Cost: ($K)**
Use FY08 dollars.

| Year | AIP | Contingency |
|---|---|---|
| 1 | 34 | |
| 2 | 48 | |
| 3 | 28 | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |
| 9 | | |
| Total | 110 | |

Contingency may be in dollars or percent. Enter figure for total project contingency.

**Effort: (FTE)**
The effort portion need not be filled out in detail by March 28

| Year | Mechanical Engineer | Electrical Engineer | Physicist | Software Engineer | Tech | Designer | Post Doc | Total |
|---|---|---|---|---|---|---|---|---|
| 1 | | 0.1 | | | 0.2 | | | 0.3 |
| 2 | | 0.05 | | | 0.3 | | | 0.35 |
| 3 | | 0.05 | | | 0.2 | | | 0.25 |
| 4 | | | | | | | | 0 |
| 5 | | | | | | | | 0 |
| 6 | | | | | | | | 0 |
| 7 | | | | | | | | 0 |
| 8 | | | | | | | | 0 |
| 9 | | | | | | | | 0 |

## Notes:

[1] **ICMS**. Check in first revision to ICMS as a *New Check In*. Subsequent revisions should be checked in as revisions to that document i.e. C*heck Out* the previous version and C*heck In* the new version. Be sure to complete the *Document Date* field on the check in screen.

[2] **Risk Assessment.** Advise of the potential impact to the facility or operations that may result as a consequence of performing the proposed activity. Example: If the proposed project is undertaken then other systems impacted by the work
include ... (If no assessment is appropriate then enter NA.)

[3] **Consequence Assessment.** Advise of the potential consequences to the facility or to operations if the proposal is not executed. Example: If the proposed project is not undertaken then ____ may happen to the facility. (If no assessment is appropriate then enter NA.)

[4] **Cost Benefit Analysis.** Describe cost efficiencies or value of the risk mitigated by the expenditure. Example: Failure to complete this maintenance project will result in increased total costs to the APS for emergency repairs and this investment of ___ will also result in improved reliability of ____. (If no assessment is appropriate then enter NA.)